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(54) Metallized acrylic coating composition in two layers

(57) **Abstract:** The invention refers to a metallized acrylic coating composition in two layers, intended as a finish of passenger cars. The metallized finish comprises the following: 10 - 20 weight parts of hydroxylated acrylic resin, 5 - 15 weight parts of oil-free saturated polyester resin, 5 - 15 weight parts of reactive melamine-formaldehyderesin, 30 - 40 weight parts of 15 % solution of cellulose esters, 10 - 20 weight parts of ethylene-vinylacetate copolymer, 1 - 12 weight parts of 35 % aluminium paste in aliphatic solvents, 0 - 4 weight parts of shading pigments, 5 - 15 weight parts of a solvents mixture of esters, aromatics and alcohols in 50 - 70 / 40 - 10 / 10 - 20 ratio. The colourless lacquer which is applied in a wet-on-wet system onto

the metallized base enamel, which constitutes the subject of this invention, is based on acrylic resin.

Number of claims: 1

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The invention refers to a novel metallized acrylic coating composition in two layers, for the finishing of passenger cars.

Two-layer metallic-effect coating compositions are known in which the metallized enamel has as its basis either a hydroxylated acrylic resin, or a polyester resin, saturated, cross-linked with a melamine resin, to which there are added cellulose esters and vinyl copolymers.

A metallized coating composition is known, destined for the finishing of passenger cars, and consisting of a basis enamel plus a colourless lacquer, the basis enamel being constituted of 20 - 30 parts of acrylic resin, 5 - 10 parts of highly reactive melamine-formaldehyde resin in xylene / butanol, 30 - 40 parts of a 15 % solution of cellulose acetobutyrate in butyl acetate, 5 - 15 parts of aluminium paste, 0.1 - 0.5 part of shading pigments and 14 - 30 parts of an aromatic solvents mixture, while the colourless lacquer is constituted of 60 - 80 parts of acrylic resin, 10 - 20 parts of high-reactive melamine-formaldehyde resin, 2 - 4 parts of medium-reactive melamine-formaldehyderesin and 2 - 4 parts of a spreading additive (RO 88533).

A metallic-effect enamel is known for the painting of passenger cars and various testing and measuring apparatus, being constituted of two components: an enamel and a curing agent, the enamel being constituted of aluminium paste, in 0.5 - 10 % proportion of a binder constituted of a mixture of acrylic resin, alkyd resin and styrene- or acryl-modified alkyd resin, in 15 - 30 % proportion and vinylacetate vinyl *[sic]* copolymer, in 0.02 - 8 % proportion, solvents, pigments, and surfactants, while the curing agent is a mixture of aliphatic and aromatic isocyanate (RO 67461). *[some of the commas in this sentence are at doubtful places - Transl.]*

The modified-acrylic metallized two-layer finish according to the invention widens the range of coating compositions, is applicable in the finishing of passenger cars, and is constituted of 10 - 20 weight parts of hydroxylated acrylic resin of 60 % nonvolatiles content, 5 - 15 weight parts of oil-free saturated polyester resin comprising 75 % of solids and of molecular mass 800 - 1000; 5 - 15 weight parts of reactive melamine-formaldehyderesin of 60 % solids content, 30 - 40 weight

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parts of a solution of cellulose esters e.g. a 15 % solution of cellulose acetobutyrate in butyl acetate, 10 - 20 weight parts of ethylene-vinylacetate copolymer being a 10 % dispersion in aromatic solvents chosen from among xylenes and toluene and in esters chosen from butyl and isobutyl acetate, 1 - 12 weight parts of a 35 % aluminium paste in aliphatic solvents such as White Spirit, in aromatic solvents chosen from among xylenes and toluene, and in esters such as butyl acetate, 0 - 4 weight parts of shading pigments such as iron oxides, carbon black, blue and green phthalocyanin pigments, red quinacridone and perylene pigments, benzimidazole, dioxazine and flavanthrone pigments, these pigments being employed in isolation or in mixtures of appropriate composition, depending on the desired shade; and 5 - 15 weight parts of a solvents mixture of esters, aromatics and alcohols in 50 - 70 : 40 - 10 : 10 - 20 ratio, examples of esters being butyl acetate, isobutyl acetate, ethylglycol *[sic]* acetate, isopropyl acetate, ethyl acetate; examples of aromatic solvents being xylene, toluene, Solvent Naphtha; examples of alcohols being *n*-butanol, isobutanol, isopropyl alcohol.

The colourless lacquer, which is applied in a wet-on-wet system onto the metallized basis enamel which constitutes the subject of the invention, is based on acrylic resin.

Through the application of the invention the nonvolatiles content of the metallized basis enamel is increased in respect of the known acrylic enamels, which confers a series of coating advantages such as:

- uniform aspect and satin gloss of the basis enamel coat, and increased flexibility of the final coating;
- smoothness and increased spreadability of the enamel plus lacquer system;
- ease of application as regards the basis enamel;
- prevention of gassing phenomena during the application of the basis enamel;
- heightened resistance under service (weatherproofness).

There now follow two examples of implementation of the invention.

Example 1. *Preparation of a silvery enamel.* From 45 g of cellulose acetobutyrate and 25.5 g of butyl acetate a solution of cellulose acetobutyrate is prepared, to which are added,

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with stirring, 10 g of hydroxylated acrylic resin, 15 g of saturated polyester resin, 5 g of reactive melamine-formaldehyde resin, 20 g of a dispersion (10 %) of ethylene-vinylacetate copolymer, 12 g of aluminium paste (35 %) and 15 g of a solvents mixture (aromatics, esters and alcohols). After full homogenization the result is a silvery basis enamel of viscosity 40 - 70 s through a DIN 4 cup at 20°C.

Example 2. *Preparation of a dark blue metallized enamel.* A shading paste is prepared using a blue phthalocyanin pigment (7 %), carbon black (7 %) and a red quinacridone pigment (7 %), in hydroxylated acrylic resin and esters, in a mill with micro-elements. From 6 g of cellulose acetobutyrate and 34 g of butyl acetate a solution of cellulose acetobutyrate is prepared, to which are added, with stirring, 5 g of hydroxylated acrylic resin, 5 g of saturated polyester resin, 15 g of reactive melamine-formaldehyde resin, 10 g of a dispersion of ethylene-vinylacetate copolymer, 13 g blue paste, 5 g black paste, 2 g red paste, 1 g aluminium paste and 4 g of solvents mixture. The shading pastes contain 4 g of pigment, 15 g of acrylic resin and 1 g of solvent. After full homogenization the result is a dark blue metallized enamel, of 60 - 80 s viscosity through a DIN 4 cup at 20°C. Homogeneity of all components is attained in a vessel fitted with a mechanical stirrer of regulable revolving speed, acting for about 1 h.

Claim

A metallized acrylic coating composition in two layers, constituted of, on the one hand, a basis enamel whose components are acrylic resin, melamine-formaldehyderesin, cellulose esters,

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aluminium paste, organic and inorganic pigments and a solvents mixture, and on the other hand a colourless lacquer based on acrylic resin, **characterized in that** it comprises 10 - 20 weight

parts of hydroxylated acrylic resin of 60 % nonvolatiles content, 5 - 15 weight parts of reactive melamine-formaldehyde resin of 60 % solids content, 5 - 15 weight parts of oil-free saturated polyester resin with a 75 % solids body and having 800 - 1000 molecular mass, 30 - 40 weight parts of a solution of cellulose esters e.g. a 15 % solution of cellulose acetobutyrate in butyl acetate, 10 - 20 weight parts of ethylene vinylacetate copolymer as a 10 % dispersion in aromatic solvents chosen between xylene and toluene and in esters chosen between butyl acetate and isobutyl acetate, 1 - 12 weight parts of a 35 % aluminium paste in aliphatic solvents such as white spirit, in aromatic solvents chosen between xylene and toluene and in esters such as butyl acetate, 0 - 4 weight parts of shading pigments such as iron oxides, Carbon Black, blue and green phthalocyanin pigments, red quinacridonic and perylenic pigments, benzimidazolic, dioxazinic and flavanthronic pigments, the pigments being employed in isolation or in mixtures in any desired proportion depending on the shade that is intended, 5 - 15 weight parts of a solvents mixture of esters, aromatics and alcohols in 50 - 70 : 40 - 10 : 10 - 20 ratio, the esters being butyl acetate, isobutyl acetate, ethyl[ene] glycol [di]acetate, isopropyl acetate, ethyl acetate, the aromatics being xylene, toluene or Solvent Naphtha, and the alcohols being *n*-butanol, isobutanol or isopropyl alcohol.

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